



## **Economic Value of Hawai'i's Forest Industry in 2001**

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### **Abstract**

A set of surveys was conducted to estimate the economic value of the Hawai'i forest industry's revenue and employment for 2001. The term *forest industry* comprises all activities involving locally grown wood including forest management, wood harvest, and wood products development and distribution. The forest industry segments surveyed included landowners, timber processors, general contractors, forestry consultants, manufacturers, nurseries and retailers. The 2001 Hawai'i forest industry revenues were estimated to be \$30.7 million with total full-time employment at slightly more than 900 full-time employees. The largest sector was retailing with revenues of \$23.9 million. This 2001 value for the forest industry represents a slight nominal increase since 1991, when the value was estimated at \$28.9 million, but a real decrease after accounting for inflation.

### **Introduction**

Forestry in Hawai'i is primarily about protecting the island watersheds, providing habitat for rare and endangered species, and providing recreation for local people and visitors. A small but important local forest industry is based on the harvest of native woods such as koa and 'ōhi'a, traditional Hawaiian woods such as kamani and milo, and exotic woods such as eucalyptus and mango. These locally harvested timbers are made into high-quality bowls, furniture, picture frames, and flooring. Having furniture and architectural items made from locally grown and processed timber gives island homes a Hawaiian sense of place and links current lifestyles to past traditions.

The 1993 Hawai'i forest industry study estimated the 1991 value of Hawai'i's commercial forest industry to be \$28.9 million, with more than 800 full-time em-

ployees (see Yanagida et al., 1993). The objective of the present study is to update the 1991 information with data for the state's forest industry's revenue and employment figures for the year 2001.

The terms *forest industry* and *forest sector* comprise all activities involving locally grown wood including forest management, timber harvest, and woodworking and retail sales. In the 1993 GACC report (see *References*), the Hawai'i forest industry was segmented into six subsector categories of activity: hardwood, short rotation biomass, agroforestry, specialty forest products, eco-tourism/recreation/hunting, and public-private partnerships. The current study segments the industry according to functional activities and employment: landowner, timber processor, general contractor, forestry consultant, manufacturer, nursery, and retailer. These functional activities describe the industry from the farm level through to the retailing activities of forest products. For these categories of economic activity associated with forestry in Hawai'i, seven survey instruments were constructed based on background information collected on Hawai'i's forest industry and from discussions with key forest industry participants from both the public and private sectors. (Copies of the surveys are available at the website [www.ctahr.hawaii.edu/trees](http://www.ctahr.hawaii.edu/trees).)

### **Brief descriptions of the surveys**

#### ***Landowner survey***

The primary intent of the landowner survey was to determine the activities of Hawai'i's private and public landowners regarding forest-based activities such as recreation, hunting, gathering specialty forest products, etc. The tax map key (TMK) database was used to determine the population of agricultural, conservation, and

“established activity unknown”<sup>(1)</sup> lands within the counties. Ten acres was the smallest parcel size considered as a viable tree farm. Five parcel size strata were used: 10–25 acres, >25–250 acres, >250–500 acres, >500–10,000 acres, and >10,000 acres. Although landowners were randomly selected, it was possible for a given landowner with more than one parcel to be selected more than once.

#### **Timber processor survey**

A list of timber processors (harvesters and millers) in the state was compiled from the Yellow Pages directory (Verizon SuperPages) and by consulting with key members of the Hawai'i Forest Industry Association and industry experts from both the public and private sectors. Including only active timber processors, the population for the state was determined to be 36. Questionnaires were sent to all members of this population.

#### **General contractor survey**

The general contractor survey measures the economic value of this subsector to the Hawai'i forest industry through activities using locally grown woods. This subsector's population was compiled from several sources including the Yellow Page directory, Associated Builders and Contractors ([www.abc.org](http://www.abc.org)), and Hawaii Business Database 2000 from the General Contractors Association of Hawaii. A representative sample from each county was randomly selected.

#### **Forestry consultant survey**

A forestry consultant is an individual with expertise in forestry management offering services such as the appraisal of forested lands, advice on taxes, development of forestry plans, forest management, and estate planning involving forested lands. An inventory of the state's forestry consultants was developed from entries from the Yellow Pages directory and from discussions with key members of the Hawai'i Forest Industry Association.

#### **Manufacturer survey**

A list of the state's timber manufacturers (woodworkers) was compiled from the Yellow Pages directory, consultation with key members of the Hawai'i Forest Industry Association, and discussions with industry experts from both the public and private sectors. The estimated timber manufacturer population in Hawai'i was 132.

#### **Nursery and forest management survey**

Forest nurseries and forest management firms engage in the development or improvement of timber stands and encompass activities such as site preparation, planting seedlings, weed and animal control, stand maintenance, and harvesting and thinning of timber stands. An inventory of the state's forestry nurseries was compiled from the Yellow Pages directory and by consulting with key members of the Hawai'i Forest Industry Association. The estimated population was determined to be 112 forestry nurseries, and all active participants were surveyed.

#### **Retailer survey**

The retailer survey measures the economic value of Hawai'i's forest industry (forest sector) to the state's economy in terms of direct payments for goods (not services or supporting businesses) made from the sale of locally grown woods to the public. An inventory of retail establishments in each county was derived from the Yellow Pages directory. A random sample of 20% was selected for surveying from each Yellow Pages category.

#### **Surveying procedures and responses**

The initial surveys used were lengthy and detailed (similar to the 1993 Hawai'i forest industry study). Early response rates were very low, and it was recommended that the surveys be substantially reduced in length to capture responses only to the key questions involving employment and revenues. The shortened surveys did improve response rates. Table 1 shows the final number of responses for each sector surveyed. Note that indus-

**Table 1. Industry segments: population and number surveyed.**

Industry segments	Estimated population <sup>*</sup>	Number of respondents
Landowners	1,035	427
Timber processors	33	6
General contractors	873	104
Forestry consultants	39	14
Manufacturers	60	16
Nurseries	81	22
Retailers	1,407	165

<sup>\*</sup>Population adjusted for active participants involving locally grown wood.

try segment populations were re-estimated to include only active participants involving locally grown wood.

### Extrapolation from sample to population

Similar to the 1993 forest industry study, estimating population values used the proportion of industry response represented by the sample. This information was obtained either from the survey data or from secondary data sources and industry experts. In the case of revenues derived from forestry:

$$\text{Industry value} = \frac{R}{P}$$

where R = total revenue from survey respondents and P = proportion of the population represented by the respondents.

### Estimated results

Revenues and full-time employment for each industry segment are shown in Table 2. Summing the seven industry segments yields total industry values for revenue and full-time employment. Total revenue for Hawai'i's forest industry in 2001 is approximately \$30.7 million. The Hawai'i forestry industry in 2001 employed slightly more than 900 full-time employees.

### Summary

How does the change in forestry revenue between 1991 and 2001 compare with other agricultural products? The slight nominal growth in forest revenues between 1991 and 2001 is quite comparable with major agricultural commodities produced and sold. As shown in Table 3, only a few agricultural commodities experienced growth in revenues or sales. Over this same period, total crops and livestock sales fell from \$551.4 million to \$524.4 million.

When inflation from 1991 to 2001 is accounted for, the actual value of the Hawai'i forest industry fell in real terms. With inflation, the \$28.9 million value in 1991 would have grown to \$34.8 million in 2001.<sup>(2)</sup> The estimated industry value of \$30.7 million in 2001 represents a 13.4% decrease in value.

The Hawai'i forestry industry remains largely based on retail sales of high-end furniture, largely made from koa. Availability of koa has decreased in the past decade. Current planting efforts, spurred by the high prices of tropical hardwoods, will nonetheless take many years

**Table 2. Revenue and full-time employment for the Hawai'i forest industry in 2001.**

Industry segment	Total revenues	Percent of revenue	Full-time employment
Landowners	4,058,289	13.2	569
Retailers	23,870,108	77.8	188
General contractors	113,108	0.4	24
Timber processors	836,250	2.7	20
Forest consultants	97,495	0.3	25
Manufacturers	1,387,500	4.5	45
Nursery owners	333,705	1.1	55
Total	30,696,455		926

**Table 3. Total revenue or value of sales, 1991 and 2001.**

Commodity* or sector	1991 (million \$)	2001	Change (%)
Sugar (unprocessed cane)	174.9	57.8	-66.95
Pineapples (fresh equivalent)	107.8	96.3	-10.67
Fruits (excluding pineapples)	24.4	30.2	23.77
Macadamia nuts	34.6	33.0	-4.62
Coffee	4.9	19.6	300.0
Forestry	28.9	30.7	6.2

\*Data source for agricultural commodities: Statistics of Hawaiian Agriculture, 1993 and 2002.

to produce marketable timber. While it is crucial to the long-term health of Hawai'i's forest industry to continue the investment in tree planting, economic results of this investment will take years to materialize.

### Prospects for the future

Despite the lack of growth in the past decade, there are signs that Hawai'i's forest industry will expand in the coming five to ten years. The major driver for future growth in the short term will primarily be fast-growing, non-native plantation tree species, rather than koa.

PruTimber, which has planted over 25,000 acres of various eucalyptus species on former sugar cane and pasture land on the Hāmākua coast and in Ka'u, will begin commercial timber harvests in the near future. Hawaiian Mahogany Inc., on Kaua'i, the state's second larg-

est industrial timber plantation, plans to begin harvest of initial plantings of eucalyptus and other species within the next ten years. Kamehameha Schools is planning to begin commercial timber harvests of koa and of high-value plantation species from their Hōnaunau forest in Kona. The trees, which were planted from the 1920s through the 1970s, will be locally made into furniture, woodwork, cabinets, and other high-value products. Kamehameha Schools is also seeking Forest Stewardship Council certification for their forest management, which would increase the marketability of forest products from the Hōnaunau forest. Finally, the state government is pursuing plans to sell timber from 11,700 acres of plantations of non-native trees in the Waiākea Timber Management Area that were established in the 1960s to supply wood for Hawai'i.

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### Notes

- <sup>1</sup> PITT code 900 represents "Homestead" properties, set up in 1991, which also signifies that the owner can claim 100% of the land and building exemptions; the subclassification 999 denotes "establishment activity unknown."
- <sup>2</sup> Using the Consumer Price Index (CPI) for Honolulu with base period 1982–1984 = 100, the CPI for 1991 and 2001 were 148.0 and 178.4, respectively. Converting the base period to 1991 = 100, the CPI for 2001 was determined to be 120.54. Accounting for inflation, the \$28.9 million estimated industry value in 1991 would be worth \$34.8 million in 2001.

### References

- Hawai'i Forest Industry Project, [www.ctahr.hawaii.edu/trees](http://www.ctahr.hawaii.edu/trees), Department of Natural Resources and Environmental Management, College of Tropical Agriculture and Human Resources, University of Hawai'i at Mānoa. 2002.
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